2011 Annual Performance Evaluation Report
Volume 2, Appendix A

Baldwin Park Operable Unit of the
San Gabriel Valley Superfund Sites
Los Angeles County, California

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Submitted to:

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APPENDIX A

Baldwin Park Operable Unit
San Gabriel Valley, California

1.0 INTRODUCTION

Plume maps and chemical cross sections were prepared to present the approximate distribution of seven chemicals of concern (COCs) in groundwater in the Baldwin Park Operable Unit (BPOU) in 2011 in accordance with the requirements of Section 5.4 of the Performance Standards Evaluation Plan (PSEP) (AMEC Geomatrix Inc, [AMEC], 2010) and the recommendations made in the technical memorandum, Response to Requested Modification #3 to the Revised Final Performance Standards Evaluation Plan, dated February 17, 2004 (Geomatrix, 2004). The technical memorandum recommended that future interpretations of the spatial distribution and temporal trends of COCs in groundwater focus on seven selected COCs: 1,2-dichloroethane (1,2-DCA); 1,4-dioxane; carbon tetrachloride; N-nitrosodimethylamine (NDMA); perchlorate; tetrachloroethene (PCE); and trichloroethene (TCE). These seven COCs were selected because they meet one or more of the following criteria:

- Observed levels of the compounds meet or exceed either California Maximum Contaminant Levels (MCLs) or, if no MCL has been established, the California Drinking Water Notification Level (NLs), as applicable.
- They occur relatively frequently in the BPOU.
- They may be a controlling compound relative to effectiveness of treatment processes used in BPOU Treatment Plants.

Plume maps and chemical cross sections for these seven COCs were previously submitted to the U.S. Environmental Protection Agency (EPA) in the 2010 Annual Performance Evaluation (PE) Report, Volume 2, dated April 6, 2011 (AMEC Geomatrix and ERM, 2011), and in earlier annual reports for the BPOU.

The plume maps and chemical cross sections were created by developing a three-dimensional (3D) representation of chemical distribution using a grid-based interpolation technique and then slicing the 3D grids at specific elevation intervals and along specific transects. The water-quality monitoring data, gridding technique, limitations, and results are discussed in the following sections.

As discussed in Section 4.0 below, while every effort has been made to achieve an accurate depiction of the distribution of these COCs at various elevation intervals, there are substantial limitations in depicting multi-dimensional images of a dynamic and complex plume. The plume maps and chemical cross sections should be viewed as best approximations based upon existing data, not exact or completely accurate expressions of a very complicated data set.

2.0 WATER-QUALITY DATA

Plume maps and chemical cross sections for each COC were generated using water-quality data primarily collected for the PSEP water-quality monitoring program and supplemented with additional data collected for California Department of Public Health (DPH) and Regional Water Quality Control Board – Los Angeles Region (RWQCB) monitoring requirements. Water-quality monitoring data used for these interpretations consist of sample results from 64 wells and 156 total sample locations, including up to 13 individual sample ports in 18 multiport wells and two discrete sample depths in four inactive production wells sampled using dedicated low-flow pumps. Results from all sample locations in the PSEP water-quality monitoring program were included in the dataset. Results from 19 supplemental monitoring and production wells were also included to provide additional data coverage. Water-quality monitoring data used to generate the plume maps and chemical cross sections are summarized in Table A-1. Sample locations are shown on Figure A-1.

Water-quality monitoring data were selected from a limited time period that was targeted around the annual sampling event in the multiport monitoring wells that was conducted in May 2011. Several multiport monitoring wells are on a semi-annual sampling frequency and these wells were sampled a second time in October or November 2011. Although the second set of results for those multiport monitoring wells that are sampled semi-annually were not included in the plume modeling, a review of the data (included in Table 5-3 of Volume 1) indicates that the second set of results would not materially affect the plume depictions for any of the compounds. Ninety-four percent of the data used for the plume maps and chemical cross sections are from water-quality samples that were collected within the one-month period from May 2 through May 27, 2011. If data from various wells were not available within this date range, then data from the next closest date were selected to create the most contemporaneous data set possible. Data utilized from outside the one-month period are limited to data from five monitoring wells.

Data validation and data-quality assessment for data used in the plume modeling are discussed in Section 5.2.2 of Volume 1.

3.0 THREE-DIMENSIONAL INTERPRETATION

Water-quality monitoring data for each COC were interpolated on a 3D grid using the geospatial software program, EarthVision®. The 3D grid developed for the plume maps is 8,400 meters wide, 19,100 meters long, and 570 meters thick. The grid was divided into cells that are 100 meters wide, 250 meters long, and 10 meters thick. The grid was rotated 38 degrees to orient it parallel to the primary groundwater flow direction (northeast-southwest) across the BPOU. The model used a vertical influence factor of 0.1 (dimensionless).

3.1 Earthvision® Gridding Technique

The 3D Grid Calculations program in EarthVision® was used to interpolate chemical concentrations that varied continuously in 3D space using the 3D minimum tension gridding technique. The minimum tension gridding algorithm calculates a smooth surface that closely fits the input data values using biharmonic cubic spline techniques. This procedure produces a 3D grid depicting the interpolated distribution of chemical concentrations throughout the defined volume. The technique is designed to match data where

they exist, to smoothly interpolate between known data points, and to extrapolate where there are no data using a splining technique to develop a smooth surface with minimum curvature.

The 3D Grid Calculations program creates a 3D grid from X, Y, Z, and property (P) input data where X, Y, and Z define the location of each point and P is the concentration value of the chemical at that point. Water-quality monitoring data are input at the exact geographic coordinates (X, Y) of the respective well and either at the mid-screen elevation of the respective well screened interval (Z) or at the exact elevation of a discrete water-quality sample collected using low-flow sampling methods. The mid-screen elevations for production wells having multiple screened intervals are represented using the mid-screen elevation of the composite screened interval.

The interpolated results are rectangular grids containing nodes at regularly spaced intervals in each dimension. The chemical concentrations being interpolated are stored for each grid node location and used for subsequent display and analysis. Once a 3D grid is calculated, it is used to create a faces file representing 3D isoconcentration shells, equivalent to two-dimensional (2D) contour lines.

The main goals of the gridding technique are to represent the input data as closely as possible and to calculate a reasonable interpolated value at grid nodes that are not on or adjacent to input data points. The two-stage minimum tension gridding technique permits gridding computation times suitable to a working environment and modeling accuracy appropriate to almost every type of input data. Estimation of interpolated values at grid nodes uses a finite-difference solution approach.

The two stages of minimum tension gridding include the initial estimate and cubic function iterations with scattered data feedback. The initial grid estimation process calculates a P-value for every grid node in an extremely coarse 3D grid that is used in the initial stages of gridding. This coarse grid contains four X-columns, four Y-rows, and four Z-levels regardless of the number of columns, rows, and levels specified by the user. This coarse grid covers the exact range specified by the user. All of the scattered data points are used as input to an inverse-distance weighted average function that calculates a P-value at each of the 64 initial node positions.

Once the starting P-values are estimated for the initial coarse grid, iterations begin. Each iteration consists of calculation of a new P-value for each grid node (one by one) with neighboring grid nodes providing input values to a cubic function that determines the new value. Once the new value is calculated for any one node, the scattered data are used for the feedback process described in the next section. Minimum tension is the distribution of tension (the second derivative or curvature of the property variation) among the nodes such that the sum of the squares of the second derivatives is minimized. The cubic function is fitted to the grid nodes in these iterations rather than to the input scattered data points. Since the input points are not used in this tension relaxation, it is possible that the property distributions represented by these grid nodes may move away from the scattered data P-values, thus not honoring the data as well. To prevent this, a scattered data feedback step follows each re-evaluation of each grid node. If no scattered data points exist within a grid cell spacing in each direction, the grid node is left with the P-value established by the just-completed function. All of the scattered data points falling within the one cell zone around the grid node in question are evaluated. The P-value(s) are determined at the X, Y, Z location(s) of the scattered data point(s) within the zone based on the current grid node values and

these P-value(s) are compared to the input P-value(s) in the scattered data. The difference between these two values should decrease between iterations as the gridding progresses. As long as this difference (deviation) is decreasing, the program accepts the new, function-derived grid node value, and proceeds to recalculate the next grid node. If the deviation increases, the node is reset to a value that more closely agrees with the scattered data point. When a neighboring point is re-evaluated, this corrected node is one of the points input to the cubic function for the next node. The iterative re-evaluation cycle distributes the correction away from the corrected node to surrounding nodes that do not have scattered data in their immediate vicinity. Through this process, the scattered data feedback keeps grid nodes tied to neighboring scattered data while allowing the cubic function to distribute tension in a reasonable fashion.

3.2 Non-Detect Values Gridding

The gridding of non-detect values requires special treatment for scattered data containing P-values equal to a user-specified non-detect value. A non-detect value is a flag in the input data set that signifies that the COC being measured was not detected above the Method Detection Limit (DL) or Reporting Limit (RL) for the respective analytical method. Non-detect flags are used as input for the plume interpretations at locations where groundwater samples were collected but chemical concentrations were below the sample quantitation limit. Non-detect flags were set to -999. An example of the non-detect application in 3D can occur with spot or random data that contain scattered data points with X, Y, Z, and P information measuring a contaminant throughout the area of interest. In this case, the edge of the contaminant plume should not necessarily pass through every scattered data point that has a non-detect P-value. If the data are randomly located, most if not all of the scattered data points with non-detect P-values should simply fall outside of the plume, and not define the exact edge of the plume. In the first gridding pass, scattered data points with the non-detect P-value are ignored. This first calculation is done using the standard minimum tension gridding technique. Using the grid from the first pass, a back-interpolated value is calculated at all unclipped non-detect points; the P-values at those points are then reset to the negative of the absolute of that calculated value. The second gridding pass uses these reset values along with the original data points used in the first pass to generate the final output grid.

4.0 LIMITATIONS

The depictions of plume geometry presented in Figures A-2 through A-50 represent the current estimate of the distribution of the COCs in the BPOU in 2011. However, as with any approach used to interpolate data between known data points, there are uncertainties and limitations to the approach that may result in alternative interpretations of the distribution of COCs in groundwater. These uncertainties and limitations are as follows:

- For clarity, and as requested by EPA, we have depicted the seven principal COCs in separate plume maps at three elevations as described in Section 5.2.3 of Volume 1. Plumes for the various COCs overlap (and/or diverge) at various depths throughout the impacted areas.

- The plume maps and chemical cross sections attempt to depict the dynamic and temporally changing 3D distribution of COCs in groundwater with static 2D images. While these maps and cross sections show 2D isoconcentration contours of the COC plumes in plan view and in profile,

they represent interpolated approximations of the distribution of COCs in groundwater based on available data. The exact subsurface distribution of the COCs cannot be completely ascertained given temporal changes in groundwater flow directions and COC concentrations, as well as the data gaps and other limitations described herein. The spatial and temporal spread of the chemical data may not encompass the entire distribution of chemicals in the groundwater (i.e., additional assumptions are necessary as to chemical concentrations in areas that may not be completely represented by monitoring wells). As such, control data were used to refine the shape of the isoconcentration contours using professional judgment. Control data were added to the input dataset for each COC to ensure that the position of the discrete and composite isoconcentration contours shown on the plume maps and chemical cross sections is consistent with the posted chemical data. In particular, results of the interpolation should be carefully evaluated in areas where available data are limited or concentrations change significantly over short distances.

- Alternative interpretations of the distribution of the COC plumes are possible and may differ from the plume depicted here by utilizing plumes drawn manually using professional judgment. For example, plume maps and chemical cross sections for certain COCs portray discontinuous plumes in areas where the plumes may in fact be continuous.

- As described in Section 2.0 above, the plume interpretations generally incorporate water-quality data for the period from May 2 through May 27, 2011. However, where data were not available for that time period, data from the next closest date during the January through December 2011 time period were utilized. While using such an expanded data set is helpful to some degree in the contouring exercise, it introduces additional uncertainties in comparing data taken from different time periods and assuming that the ultimate projection is a consistent one. Moreover, even using this temporally diverse data set, there are inevitable gaps in the existing data that limit our ability to define the distribution of COCs in groundwater completely. In addition, the EarthVision® software used to create the plume maps and chemical cross sections utilizes certain algorithms to interpolate or “fill in” data gaps in order to provide a more comprehensive picture of the distribution of COCs. Although the EarthVision® software objectively applies the selected interpolation scheme, other software and other interpolation schemes may be applied that may generate reasonable, yet differing, results, each appropriately honoring the available monitoring data. This is not a unique limitation of the EarthVision® software, but simply a limitation of any methodology with limited data. Consequently, the interpretation may result in differences between actual and interpreted concentrations at any given point in the Project area.

- The Duarte Fault is represented as a diffuse zone of faulting on the plume maps and chemical cross sections. However, no faulting was explicitly represented in any way in the 3D grid used to interpolate the plumes. The diffuse fault zone is considered to be a reasonable representation of the uncertainty in the fault’s location as it has several fault splays concealed beneath alluvial deposits.

- The northern-most limits of some COCs depicted on the plume maps are uncertain due to the limited amount of data available to the CR group from other EPA-named PRPs, including the

Mobil/Lockheed/Valspar group, as well as other entities that may be PRPs in the northern portions of the BPOU. In consideration of the lack of recent available groundwater data from several PRP facilities and historical detections of several COCs such as TCE and PCE in the area north of the Duarte Fault zone, isoconcentration contours for TCE and PCE are truncated at the downgradient (southern) extent of the Duarte Fault zone.

Various contours created by the EarthVision® software differ from contours that individual Cooperating Respondents (CRs) might have depicted based upon their own professional analyses and judgments. These maps reflect our operation of the EarthVision® software and should not be taken as an admission by any CR for any purpose, and specifically they should not be taken as an admission by any CR that they accurately reflect such CR's views as to actual conditions in the BPOU area. Even with these limitations, the plume maps, chemical cross sections, and isoconcentration shells provide useful information on general chemical distributions, if one appreciates the inherent limitations.

5.0 RESULTS

Final grid values were contoured at the respective applicable regulatory contaminant level, either the MCL or, if no MCL has been established, the NL, and were visualized as 3D isoconcentration shells that can be rotated and viewed from any perspective.

The lateral distribution of the selected COCs is shown in plan view at three specific elevation intervals. The three elevation intervals are as follows:

- Elevations between the water table (or potentiometric surface) and -200 feet msl;
- Elevations between -200 feet and -500 feet msl; and
- Elevations below -500 feet msl.

The plume maps for the three elevation intervals shown include two sets of isoconcentration contours on each map. Isoconcentration contours at "discrete" elevations are shown for thin slices through the plumes at -50, -350 and -550 feet msl. Isoconcentration contours for "composite" elevation intervals are also shown for thick wedges of the plume between the water table and -200 feet msl, between -200 and -500 feet msl, and below -500 feet msl. On some of the plume maps, the isoconcentration contour lines at discrete elevations (dashed contour line) and the isoconcentration contour line for the composite elevation interval (solid contour line) overlap so that the discrete contour is not separately visible.

Chemical cross sections showing the vertical distribution of selected COCs along four discrete transects are also presented. The locations of these cross sections are shown on Figure A-1. Cross section A-A' represents a north-south transect that is aligned generally with the longitudinal axis of the COC plumes. Cross Sections B-B', C-C', and D-D' represent west-east or northwest-southeast transects that are aligned generally perpendicular to the dominant groundwater flow direction in the BPOU. Cross sections B-B', C-C', and D-D' show the distribution of the COC plumes in the upgradient, mid-plume, and downgradient areas of the BPOU, respectively, and include various production wells that are vulnerable to lateral migration of the COC plumes toward the west or east.

Given the 3D nature of the plume, the reader is encouraged to consider the 3D visualization that is inset in the corner of each figure when reviewing the 2D plume maps and chemical cross sections. This will provide the appropriate context within which to review the isoconcentration contours in each elevation interval and along each transect. It should be noted that the water-quality data used to create the 3D plume interpretations are posted on the plume maps according to the composite elevation intervals described above. Therefore, in many instances the discrete contours may not appear to correspond to water-quality data that are within the composite elevation interval but that are either above or below the elevation of the discrete contours.

Isoconcentration shells, plume maps, and chemical cross sections for seven COCs are shown in Figures A-2 through A-50. The isoconcentration shells visualized in 3D perspective represent views of the COC plumes looking toward the north and represent the interpreted 3D extent of each COC at concentrations meeting or exceeding the respective applicable MCL or NL. The bottom of the isoconcentration shells is bounded by the underlying bedrock surface at the base of the aquifer. The bedrock surface was obtained in a Geographic Information System (GIS) layer from the EPA/CH2M-Hill San Gabriel Basin Database website. The top of the isoconcentration shells is bounded by a simulated potentiometric surface from the BPOU groundwater flow model.

Generalized distributions of each chemical are also shown on Figures 5-8 through 5-14, included in Volume 1. The isoconcentration contours shown on these figures represent the composite lateral extent of each chemical for every elevation within the 3D grid. General observations and apparent changes in the spatial distribution of COCs in the BPOU compared to the previous year are discussed in Section 5.2.3 of Volume 1.

When reviewing the discussion in Section 5.2.3 of Volume 1, apparent changes in the interpreted spatial distribution of a particular COC plume from year to year should be considered with due caution. Historical variations in chemical concentrations have been observed seasonally and from year to year as basin water levels vary. In some instances, observed COC concentrations have fluctuated above and below MCLs (or NLs) and RLs (or DLs) during the span of one or two years or even from one sampling event to the next. Therefore, very slight changes in water-quality results from one sampling event to the next may significantly alter the interpreted spatial extents of the COC plumes that are depicted on the plume maps and chemical cross sections. Therefore, while the apparent short-term changes in the interpreted plume extents may be representative of seasonal or annual changes, the apparent short-term changes should not be considered as representative of longer-term (multi-year) trends until such observations can be confirmed over several years. This is particularly important for wells located along the perimeter of the plumes.

Subject to the foregoing limitations, the plume maps and chemical cross sections provide a reasonable approximation of the distribution of chemical concentrations across most of the BPOU within the time frame analyzed, although the precise extent of the COC plumes in certain areas may be subject to additional interpretation.

We have attempted to use a comprehensive and approximately contemporaneous dataset for the development of 3D interpretations of plume maps and chemical cross sections for individual COCs. The

use of any water-quality data from a particular well or series of wells, however, does not necessarily indicate that such well is impacted by contaminants originating from a source identified by EPA as a PRP in the BPOU.

6.0 REFERENCES

AMEC Geomatrix, Inc. (AMEC), 2010, Revised Final Performance Standards Evaluation Plan, Rev.2, 9 September 2010.

AMEC Geomatrix and ERM, 2011, 2010 Annual Performance Evaluation Report, Baldwin Park Operable Unit of the San Gabriel Valley Superfund Sites, Los Angeles County, California, 6 April 2011.

Geomatrix, 2004, Technical Memorandum – Response to Requested Modification #3 to the Revised Final Performance Standards Evaluation Plan, 17 February 2004.

TABLE A-1
WATER QUALITY MONITORING DATA FOR PLUME MODELING
Baldwin Park Operable Unit
San Gabriel Valley, California

Well Name	Site ID	Port[a]	Date	1,2-Dichloroethane (ug/L)	1,4-Dioxane (ug/L)	Carbon Tetrachloride (ug/L)	N-Nitrosodimethylamine (ng/L)	Perchlorate (ug/L)	Tetrachloroethene (ug/L)	Trichloroethene (ug/L)
Federal or California State MCL (NL)[b]				**0.5**	**(1)**	**0.5**	**(10)**	**6**	**5**	**5**
AJ MW-2R	W11AJMW2R		4/22/11	0.24 J	**1.9**	**0.51**	2 U	4.1	**140**	**120**
AJ MW-4	W11AJMW4		4/22/11	**0.85**	**1.1**	**1.1**	2 U	**37**	**63**	**100**
AJ MW-6	W11AJMW6		4/22/11	0.5 U	1 U	0.43 J	2 U	3 U	**9.1**	**12**
ALR MW-1R	W11AZW1R		10/25/11	0.5 U	0.41 J	0.5 U	2.7	1.1 J	4.7	**29 J**
ALR MW-8	W11AZW08		10/25/11	0.5 U	0.5 U	0.5 U	2 U	1.6 J	3.4	**12**
ALR MW-9	W11AZW09		10/25/11	0.5 U	**2.9**	**0.74**	**220**	4.9	**620**	**160**
CC E DURBIN[c]	01902920		--	--	--	--	--	--	--	--
CDWC 14	08000174		5/2/11	0.5 U	NR	0.5 U	2 U	5.2	1	2.1
CDWC 2	01901181		5/2/11	0.5 U	NR	0.5 U	2 U	2 U	0.59	0.5 U
CDWC 3	01903057		5/2/11	0.5 U	NR	**2.2**	**15**	**7.6**	**13**	**22**
CDWC 5A	08000100		5/2/11	0.5 U	NR	**0.84**	2 U	2 U	**5.2**	**6.9**
CDWC 6	01902967		5/2/11	0.5 U	NR	**1.4**	2 U	3.9	**13**	**18**
CDWC 8	01903081		5/2/11	0.5 U	NR	0.5 U	2 U	2 U	1.6	0.5 U
CIC BALDWIN 1[c]	01900885		--	--	--	--	--	--	--	--
COI 5	08000097		5/2/11	0.5 U	0.5 U	0.5 U	2 U	4.5	3	2
EPA MW 5-01	EPAW51	Port 13	5/25/11	0.5 U	0.12 J	0.5 U	2 U	5.3	1 U	1 U
		Port 12	5/25/11	0.5 U	0.33 J	0.5 U	2 U	2.5	1 U	0.79 J
		Port 11	5/25/11	0.5 U	0.18 J	0.5 U	2 U	3.1	1 U	0.85 J
		Port 10	5/25/11	0.5 U	0.5 U	0.5 U	1.2 J	1 J	1 U	0.68 J
		Port 9	5/25/11	0.5 U	0.13 J	0.5 U	2 U	5.9	0.55 J	4.1
		Port 8	5/25/11	0.5 U	NR	0.5 U	2 U	**11**	0.61 J	0.53 J
		Port 7	5/25/11	0.5 U	NR	0.5 U	2 U	4.3	1 U	1.8
		Port 6	5/25/11	0.5 U	NR	0.5 U	2 U	**12**	1 U	1 U
		Port 5	5/24/11	0.5 U	NR	0.5 U	2 U	**6.9**	1 U	1 U
		Port 4	5/24/11	0.5 U	NR	0.5 U	2 U	2 U	1 U	1 U
		Port 3	5/24/11	0.5 U	NR	0.5 U	2 U	2 U	1 U	1 U
		Port 2	5/24/11	0.5 U	NR	0.5 U	6.2	2 U	1 U	0.62 J
		Port 1	5/24/11	0.5 U	NR	0.5 U	2 U	2 U	1 U	1 U
HARTWELL MW-1	V10ACMW1		5/16/11	1 U	--	1 U	--	--	1 U	1 U
HUFFY MW-1	W10BDMW1		8/25/11	0.5 U	--	0.5 U	--	--	**228**	**63**
HUFFY MW-2	W10BDMW2		8/25/11	0.5 U	--	0.5 U	--	--	**6.5**	**5.6**
LACO KEY	Z1000006		5/12/11	**1.1**	**18**	**0.73**	9.2	**27**	**140**	**160**
LACO SANTA FE 1	08000070		5/10/11	0.5 U	0.5 U	0.5 U	--	2 U	1 U	1 U
			5/26/11	--	--	--	2	--	--	--

TABLE A-1
WATER QUALITY MONITORING DATA FOR PLUME MODELING
Baldwin Park Operable Unit
San Gabriel Valley, California

Well Name	Site ID	Port[a]	Date	1,2-Dichloroethane (ug/L)	1,4-Dioxane (ug/L)	Carbon Tetrachloride (ug/L)	N-Nitrosodimethylamine (ng/L)	Perchlorate (ug/L)	Tetrachloroethene (ug/L)	Trichloroethene (ug/L)
Federal or California State MCL (NL)[b]				**0.5**	**(1)**	**0.5**	**(10)**	**6**	**5**	**5**
LPVCWD 2	01901460		6/6/11	**4**	**2.3**	**5.7**	**320**	**81**	**5**	**110**
LPVCWD 3	01902859		6/6/11	0.5 U	0.5 U	0.5 U	4.4	**11**	0.87	3.3
LPVCWD 5	01902859		5/2/11	**1.2**	**1**	**1.2**	**94**	**33**	2.5	**27**
MW 5-03	BPW503	Port 10	5/16/11	0.5 U	**2.2**	0.5 U	2 U	**30**	2.2	2.3
		Port 9	5/16/11	0.5 U	**2.1**	0.5 U	**97**	**31**	**62**	**19**
		Port 8	5/16/11	0.5 U	0.5 U	0.5 U	2 U	2.4	1	3.2
		Port 7	5/16/11	0.5 U	0.5 U	0.5 U	2 U	2.3	1.5	1.2
		Port 6	5/16/11	0.5 U	0.5 U	0.5 U	0.57 J	2.2	**5.6 J**	1.1 J
		Port 5	5/16/11	0.5 U	NR	0.5 U	2 U	**11**	0.61 J	1 U
		Port 4	5/16/11	0.5 U	NR	0.5 U	0.78 J	**6.5**	1 U	1 U
		Port 3	5/16/11	0.5 U	NR	0.5 U	2 U	**11**	1 U	1 U
		Port 2	5/16/11	0.5 U	NR	0.5 U	0.53 J	1.4 J	1 U	1 U
		Port 1	5/23/11	0.5 U	NR	0.5 U	2 U	2 U	1 U	1.1 J
MW 5-05	BPW505	Port 4	5/11/11	0.5 U	**1.3**	0.5 U	2 U	**24 J**	**30**	**72**
		Port 3	5/11/11	**1.7**	**7.6**	**2.6**	**47**	**51 J**	**260**	**540**
		Port 2	5/11/11	**3.4**	**10**	**3**	**120**	**55 J**	**680**	**490**
		Port 1	5/11/11	**3**	**5.5**	**11**	**100**	**100**	**76**	**220**
MW 5-08	BPW508	Port 4	5/11/11	**2**	**5.8**	**1**	5.7	**17 J**	**370**	**310**
		Port 3	5/11/11	0.5 U	0.5 U	**2.5**	2 U	1.6 J	**11**	**11**
		Port 2	5/11/11	0.5 U	0.5 U	**1.4**	2 U	2 UJ	**11**	**9.4**
		Port 1	5/11/11	0.5 U	0.5 U	0.5 U	0.85 J	2 UJ	1 U	1 U
MW 5-11	BPW511	Port 3	5/13/11	0.5 U	0.5 U	**1.3**	**65**	**44**	**220**	**110**
		Port 2	5/13/11	0.5 U	0.5 U	0.5 U	1.1 J	1.6 J	**93**	**42**
		Port 1	5/13/11	0.5 U	0.5 U	0.5 U	2.4	2.2	**16**	**6.5**
MW 5-13	BPW513	Port 3	5/12/11	0.5 U	**1.6**	**1.4**	**79**	**13**	**260**	**140**
		Port 2	5/12/11	0.5 U	0.31 J	0.5 U	0.9 J	2 U	**42**	**51**
		Port 1	5/12/11	0.5 U	0.29 J	0.5 U	2.2	2.2	3.6	0.88 J
MW 5-15	BPW515	Port 3	5/19/11	0.5 U	0.87	0.5 U	2 U	**10**	2.4	**6**
		Port 2	5/19/11	**0.61**	**8.8**	0.5 U	**39**	**18**	**19**	**40**
		Port 1	5/19/11	**6.3**	**4.2**	**3.4**	**680**	**110**	**15**	**180**
MW 5-17	BPW517	Port 3	5/13/11	0.5 U	**2.8**	0.5 U	2 U	2 U	4.3	1.6
		Port 2	5/13/11	0.5 U	0.5 U	0.5 U	2 U	2 U	3.4	1.8
		Port 1	5/13/11	0.5 U	0.5 U	0.5 U	4.3	2 U	**5.1**	1.7
MW 5-18	BPW518	Port 3	5/25/11	0.5 U	0.5 U	0.5 U	2 U	3.3	3.1	2.1
		Port 2	5/25/11	0.5 U	0.16 J	0.5 U	2 U	**6**	1.1	1 U
		Port 1	5/25/11	0.5 U	NR	0.5 U	2 U	4.9	1 U	1 U

TABLE A-1
WATER QUALITY MONITORING DATA FOR PLUME MODELING
Baldwin Park Operable Unit
San Gabriel Valley, California

Well Name	Site ID	Port[a]	Date	1,2-Dichloroethane (ug/L)	1,4-Dioxane (ug/L)	Carbon Tetrachloride (ug/L)	N-Nitrosodimethylamine (ng/L)	Perchlorate (ug/L)	Tetrachloroethene (ug/L)	Trichloroethene (ug/L)
Federal or California State MCL (NL)[b]				**0.5**	**(1)**	**0.5**	**(10)**	**6**	**5**	**5**
MW 5-19	BPW519	Port 6	5/17/11	0.5 U	0.5 U	0.5 U	2 U	2.5	1 U	1 U
		Port 5	5/17/11	**0.74**	0.5 U	0.5 U	**11**	**16**	3.8	**6.2**
		Port 4	5/17/11	**0.6**	0.5 U	**2.8**	**40**	**16**	3.5	**16**
		Port 3	5/17/11	0.5 U	NR	**6.5**	8.4	**8.7**	2.8	**11**
		Port 2	5/17/11	0.5 U	NR	**0.5**	2 U	2 U	1 U	1 U
		Port 1	5/17/11	0.5 U	NR	0.5 U	2 U	2 U	1 U	1 U
MW 5-20	BPW520	Port 7	5/18/11	0.5 U	NR	0.5 U	2 U	5.6	1	2.5
		Port 6	5/18/11	0.5 U	NR	0.5 U	2 U	**13**	0.67 J	1.4
		Port 5	5/18/11	**1**	0.54	**0.66**	**120**	**17**	0.7 J	**12**
		Port 4	5/18/11	**5.4**	**2.5 J**	**3.9**	**720**	**100**	**6.7**	**94**
		Port 3	5/18/11	**4.3**	**3.2 J**	**5.1**	**520**	**140**	**11**	**110**
		Port 2	5/18/11	0.5 U	0.5 UJ	**0.92**	2 U	**9.4**	1 U	1 U
		Port 1	5/18/11	0.5 U	NR	**6.4**	2 U	5	1 U	3.4
MW 5-22	BPW522	Port 6	5/19/11	0.5 U	NR	0.5 U	2 U	4 U	3.3	1.9
		Port 5	5/19/11	0.5 U	NR	0.5 U	2 U	4.3	1 U	1 U
		Port 4	5/19/11	0.5 U	NR	**2.6 J**	0.56 J	**6.2**	1 U	3.4 J
		Port 3	5/19/11	**2.7**	NR	**4.3**	**260**	**62**	4.3	**44**
		Port 2	5/19/11	0.5 U	NR	**2**	2 U	2 U	1 U	1 U
		Port 1	5/19/11	0.5 U	NR	**1.7 J**	2 U	2 U	1 U	1 U
MW 5-23	BPW523	Port 6	5/20/11	0.5 UJ	NR	0.5 UJ	2 U	2 U	1 UJ	1 UJ
		Port 5	5/20/11	0.5 U	0.29 J	0.5 U	2 U	**11**	2.8	0.78 J
		Port 4	5/20/11	**4.3 J**	**2.3**	**1.2 J**	**1300**	**56**	1.6 J	**25 J**
		Port 3	5/20/11	**2.6**	**3.2**	**2.3**	**520**	**91**	**9.8**	**73**
		Port 2	5/20/11	0.5 U	0.19 J	**4.6 J**	1.3 J	3.8	1 U	3.2 J
		Port 1	5/20/11	0.5 U	NR	**5.4**	2 U	1.7 J	1 U	3.9
MW 5-24	BPW524	Port 7	5/27/11	0.5 U	**3.2**	0.5 U	0.67 J	**13**	**51**	**25**
		Port 6	5/27/11	**1.8**	**2.1**	**3.5**	**110**	**70**	**360**	**230**
		Port 5	5/27/11	**0.91**	0.94	**0.91**	**19**	**16**	**440**	**260**
		Port 4	5/27/11	0.5 U	0.75	**0.8**	0.81 J	3.5	**200**	**260**
		Port 3	5/27/11	0.5 U	0.69	0.5 U	0.72 J	2 U	**6.9**	**16**
		Port 2	5/27/11	0.5 U	**11**	0.5 U	0.58 J	1.5 J	1 U	1 U
		Port 1	5/27/11	0.5 U	**9.9**	0.5 U	2 U	2 U	1 U	1 U

TABLE A-1
WATER QUALITY MONITORING DATA FOR PLUME MODELING
Baldwin Park Operable Unit
San Gabriel Valley, California

Well Name	Site ID	Port[a]	Date	1,2-Dichloroethane (ug/L)	1,4-Dioxane (ug/L)	Carbon Tetrachloride (ug/L)	N-Nitrosodimethylamine (ng/L)	Perchlorate (ug/L)	Tetrachloroethene (ug/L)	Trichloroethene (ug/L)
Federal or California State MCL (NL)[b]				**0.5**	**(1)**	**0.5**	**(10)**	**6**	**5**	**5**
MW 5-25	BPW525	Port 7	5/23/11	0.5 U	NR	0.5 U	2 U	2 UJ	1 U	1 U
		Port 6	5/23/11	0.5 U	NR	0.5 U	2 U	5.4 J	0.98 J	1.1 J
		Port 5	5/23/11	0.5 U	0.18 J	0.5 U	2 U	**17 J**	1.4 J	0.6 J
		Port 4	5/23/11	0.5 U	0.11 J	**0.56**	2 U	**21 J**	0.88 J	0.88 J
		Port 3	5/23/11	0.5 U	0.5 U	**0.7**	2 U	**17 J**	1 U	1 U
		Port 2	5/23/11	0.5 U	0.5 UJ	0.5 U	2 U	3.2 J	1 U	1 U
		Port 1	5/23/11	0.5 U	0.5 UJ	**2.7**	2 U	1.3 J	1 U	1 U
MW 5-26	BPW526	Port 7	5/26/11	0.5 U	NR	0.5 U	0.99 J	1.2 J	1 U	1 U
		Port 6	5/26/11	0.5 U	NR	0.5 U	1 J	2 U	0.85 J	1 U
		Port 5	5/26/11	0.5 U	NR	0.5 U	1 J	2 U	1 U	1 U
		Port 4	5/26/11	0.5 U	NR	0.5 U	1 J	2 U	1 U	1 U
		Port 3	5/26/11	0.5 U	NR	0.5 U	0.86 J	2 U	1 U	1 U
		Port 2	5/26/11	0.5 U	NR	0.5 U	2 U	2 U	1 U	1 U
		Port 1	5/26/11	0.5 U	NR	0.5 U	2 U	2 U	1 U	1 U
MW 5-27	BPW527	Port 7	5/27/11	0.5 U	NR	0.5 U	2 U	2.4	1 U	1 U
		Port 6	5/27/11	0.5 U	NR	0.5 U	0.69 J	2 U	1 U	1 U
		Port 5	5/27/11	0.5 U	NR	0.5 U	0.57 J	2 U	1 U	1 U
		Port 4	5/27/11	0.5 U	NR	0.5 U	0.64 J	2 U	1 U	0.83 J
		Port 3	5/26/11	0.5 U	NR	0.5 U	0.71 J	2 U	1 U	1 U
		Port 2	5/26/11	0.5 U	NR	0.5 U	0.88 J	2.9	1 U	1 U
		Port 1	5/26/11	0.5 U	NR	0.5 U	1.9 J	2 U	1 U	1 U
MW 5-28S	BPW528S		5/11/11	0.5 U	0.5 U	0.5 U	9.9	**8.8**	1 U	1 U
MW 5-28I	BPW528I		5/11/11	0.5 U	0.5 U	0.5 U	2 U	3.7	1 U	1 U
MW 5-28D	BPW528D		5/11/11	0.5 U	0.5 U	0.5 U	2 U	2 U	1 U	1 U
SA1-1	08000185		5/25/11	0.5 U	**1.7**	0.5 U	2 U	**7.1**	**7.4**	4.2
SA1-2[d]	08000186		--	--	--	--	--	--	--	--
SA1-3 (LANTE)	08000060		5/25/11	**0.55**	**3**	**1.2**	**18**	**17**	**510**	**150**
SGVWC B25A	08000187		5/9/11	**0.92**	**1.6**	**2.6**	**98**	**30**	**24**	**50**
SGVWC B25B	08000188		5/9/11	0.5 U	0.59	**6**	**10**	5.9	**5.8**	**17**
SGVWC B26A	08000189		5/3/11	**3**	**2.3**	**2.1**	**440**	**61**	4.8	**48**
SGVWC B26B	08000190		5/3/11	**1.4**	**1.5**	**11**	**61**	**34**	1.3	**42**
SGVWC B5B	61900719		5/2/11	0.28 J	0.5 U	0.29 J	**20**	**9.2**	2	3.4
SGVWC B5D	08000160		5/2/11	0.5 U	0.5 U	**0.53**	2 U	2 U	0.5 U	0.5 U
SGVWC B5E	08000205		5/2/11	**0.57**	0.5 U	**2.4**	**62**	**12**	1.5	**9.3**
SGVWC B6C	71903093		5/26/11	**0.55**	0.5 U	0.5 U	**12**	**9.2**	0.5 U	4.4

TABLE A-1
WATER QUALITY MONITORING DATA FOR PLUME MODELING
Baldwin Park Operable Unit
San Gabriel Valley, California

Well Name	Site ID	Port[a]	Date	1,2-Dichloroethane (ug/L)	1,4-Dioxane (ug/L)	Carbon Tetrachloride (ug/L)	N-Nitrosodimethylamine (ng/L)	Perchlorate (ug/L)	Tetrachloroethene (ug/L)	Trichloroethene (ug/L)
Federal or California State MCL (NL)[b]				**0.5**	**(1)**	**0.5**	**(10)**	**6**	**5**	**5**
SGVWC B6D	78000098		5/26/11	**1.8**	**1.3**	**6.7**	**100**	**47**	1.4	**74**
SWS 121W1	08000181		11/1/11	--	--	--	--	3	--	--
SWS 139W2	01901599	93.2	5/11/11	0.5 U	NR	0.5 U	--	**8.9**	1 U	1 U
			5/13/11	--	--	--	2 U	--	--	--
		-1.8	5/11/11	0.5 U	NR	0.5 U	--	**8.2**	0.74 J	1 U
			5/13/11	--	--	--	2 U	--	--	--
SWS 139W6	08000152		5/11/11	0.5 U	NR	0.5 U	--	**6.6**	1 U	1 U
			5/13/11	--	--	--	2 U	--	--	--
SWS 140W5	08000145		5/10/11	0.5 U	NR	0.5 U	--	**8**	0.53	4.6
			5/13/11	--	--	--	**12**	--	--	--
SWS 142W2	08000183		5/5/11	0.5 U	NR	0.5 U	2 U	2 U	0.5 U	0.5 U
SWS 151W2	08000207		5/5/11	0.5 U	NR	0.5 U	2 U	2 U	0.5 U	0.5 U
VCWD BIG DALTON	01900035	92.7	5/12/11	0.5 U	0.5 U	0.5 U	2 U	**11**	1 U	1 U
		-42.3	5/12/11	0.5 U	0.5 U	0.5 U	2 U	**9.2**	1 U	0.45 J
VCWD E MAINE	01900027		5/10/11	0.5 U	NR	0.5 U	--	2 U	1 U	1 U
			5/13/11	--	--	--	2 U	--	--	--
VCWD MORADA	01900029	54.4	5/12/11	0.5 U	0.5 U	0.5 U	2 U	**11**	1.8	1 U
		-25.6	5/12/11	0.5 U	0.5 U	0.5 U	2 U	**9.7**	2.2	0.52 J
VCWD PADDY LN	01900031	7.2	5/12/11	**2.6**	**2**	**0.95**	**21**	**38**	3.5	**29**
		-112.8	5/12/11	**2.5**	**1.9**	**0.78**	**130**	**38**	2.7	**23**
VCWD W MAINE	01900028		5/10/11	0.5 U	NR	0.5 U	--	2 U	1 U	1 U
			5/13/11	--	--	--	2 U	--	--	--
WHICO MP-1	W10WHMP1	Port 6	5/12/11	0.5 U	0.5 U	0.5 U	0.5 J	**11**	**27**	**19**
		Port 5	5/12/11	0.5 U	0.5 U	**1.2**	8.1	**17**	**170**	**90**
		Port 4	5/12/11	0.5 U	0.5 U	0.5 U	**23**	2	**220**	**120**
		Port 3	5/12/11	0.5 U	0.5 U	0.5 U	1.6 J	2 U	**80**	**60**
		Port 2	5/12/11	0.5 U	0.5 U	0.5 U	2 U	2.8	**10**	**11**
		Port 1	5/12/11	0.5 U	0.49 J	0.5 U	2 U	2 U	**11**	3.5

Notes:

a. For inactive production wells, elevation in feet above mean sea level of discrete low-flow samples.

b. Federal or California State Maximum Contaminiant Level (MCL), or Notification Level (NL)

c. Well inoperable in 2011.

NR - Sample not required.

-- Sample result unavailable.

U - Analyte not detected at the reported quantitation limit shown in the result.

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ - Analyte not detected at the reported quantitation limit shown in the result; the reported qunatitation limit is estimated.